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AUTHOR Gillespie, John O.
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ABSTRACT

For the last 10 years, the Duval County School System (Jacksonville, Florida) has accumulated extensive student performance data with its district-wide criterion referenced testing program (the Essential Skills Test for K-6 students and the Minimum Level Skills Test for grades 7-12), which tests over 100,000 students yearly. The research project summarized in this report analyzed the testing data to identify students' academic strengths and weaknesses, determine what grade levels and areas experience a breakdown in understanding, and discover what the county can do to increase mastery of essential concepts. Duvall County used its own curriculum objectives guides to create the STRANDS model, a mechanism that follows students' mastery of essential skills objectives in the elementary grades and their subject area mastery in the secondary grades. Using flowchart analysis techniques, the research team could plot the percentage of students passing all objectives at all levels. STRAND has helped the district narrow its focus considerably. The flowchart analysis has helped the district provide intervention strategies for students with low reading comprehension scores, compare students from different demographic groups, and improve teaching and instructional strategies. Two flowcharts (for 1988 and 1989) are included. (MLH)

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STRANDS:
AN ANALYSIS OF SEQUENCED ESSENTIAL SKILL OBJECTIVES BY SUBJECT AREAS AND THROUGH THE GRADE LEVELS

Presented by Dr. John O. Gillespie

Duval County School System

1701 Prudential Drive

Jacksonville, Florida 32207

1990

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EA 021 720

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For the last ten years, the Duval County School System has accumulated extensive student performance data with its district wide criterion-referenced testing program, which tests over 100,000 students each year. At the end of each school year, students enrolled in kindergarten through the sixth grade are administered the Essential Skills Test (EST), a criterion-referenced test of reading and mathematics. Students enrolled in grades 7th through 12th are administered the Minimum Level Skills Test (MLST), a criterion-referenced tests in the subject areas of English, science, mathematics and social studies. All 200 plus tests measure a minimum of 20 to a maximum of 60 objectives.

This research project analyzed the testing data hoping to gain an understanding of what students know and don't know, at what grade levels and areas there is a breakdown in understanding, and what the county can do to assist students in the mastery of essential concepts.

In order to systematically approach this research, a model was developed to represent essential skills objectives mastery through subject areas across grade levels. Duval County used a curriculum scope and sequence called SLAMS (Sequenced Language Arts and Math Skills) as a format guide. SLAMS was written by Dr. David C. Coleman, presently of California State University, under the auspices of William

Bugher, Associate Executive Secretary for the Administration of Phi Delta Kappa.

Duval County then used its own curriculum objective guides developed by the Division of Instruction of the Duval County Public Schools to create the STRANDS model. STRANDS is a mechanism that follows the students's mastery of essential skills objectives as students progress through the elementary grades and subject areas in the secondary grades.

Duval County assembled a group of elementary school teachers and subject area content specialists to assist the test development staff in ascertaining which of the tested objectives in the latter grades were dependent upon prerequisite objective mastery for the understanding of the "strand" concept.

Once this was done a flow chart was developed by staff to plot these objectives back to their introduction in the testing cycle. Using down loaded information from our mainframe computer, we were then able to plot the percentage of students passing all objectives at all grade levels. This enabled us to identify immediately the areas where the testing instrument might be faulty. Once the group of teachers addressed these testing concerns, we were then able to pinpoint other areas of weakness. (See chart 1).

As the chart indicates, in 1988 only 67% of the 5th grade students were able to master the objective calling for the addition and subtraction of like and unlike proper fractions. The instructional implications could indicate

that additional instruction and materials in this area might be appropriate, especially since that same group of students in 1989 did almost as poorly for the objective that followed in the 6th grade. Only 69% of the students passed adding and subtracting like and unlike mixed numbers, the objective building upon the previous year's objective. (See Chart 2).

With so many variables present in the learning process of a child, narrowing the focus to help educators pinpoint specific areas of need means that problem areas can be more readily addressed. Educators can then supplement the instruction of students with problems and make their educational experiences more meaningful and successful.

With STRANDS in place we are now able to narrow our focus far more accurately. Results from an analysis of a STRANDS flow chart model can now be used to such things as:

1. monitor the scores and provide intervention strategies for students-at-risk whose reading comprehension scores begin to drop as they move through the grades.

2. compare students from different demographic groups to ascertain problems or strengths while progressing through school.

3. improve teaching and instructional strategies for individual as well as specific groups of students.

4. analyze the appropriate introduction and expected mastery of skills at grade levels.

5. analyze, compare and research computer software for for the matching of skills.

This analysis has also brought up some interesting questions that we hope to be able to explore and answer in the near future. Some of them are:

1. At what particular grade levels or which set of objectives do students who drop out of school have the most difficulty?

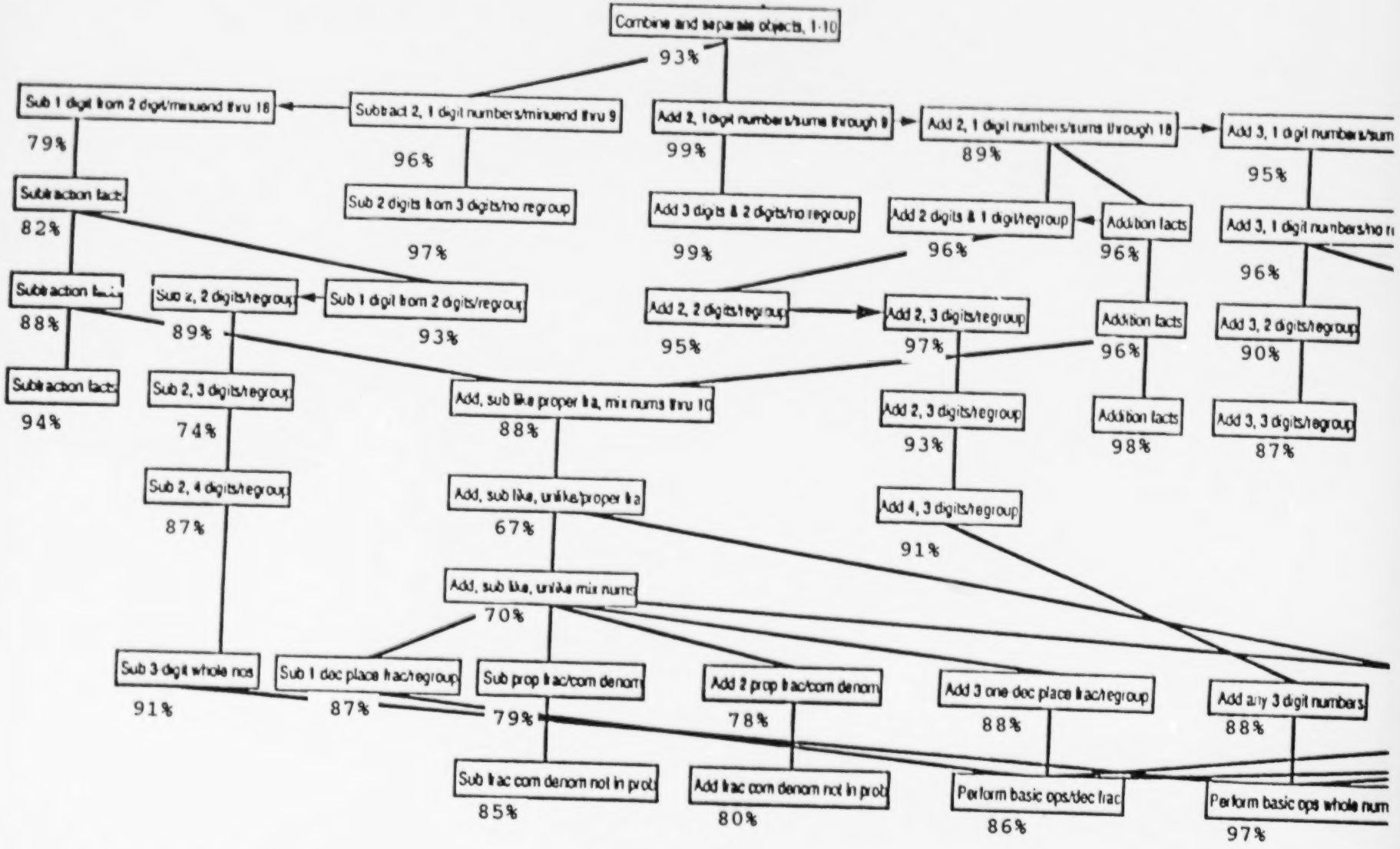
2. Which prerequisite curriculum objectives can be identified as weakness areas for students who have exhibited "drop-out" behaviors so that intervention can occur as soon as possible?

3. What then can we do as a county to see to it that when breakdowns occur, a student or group of students is appropriately served?

CHART 1

OPERATION STRAND

1988



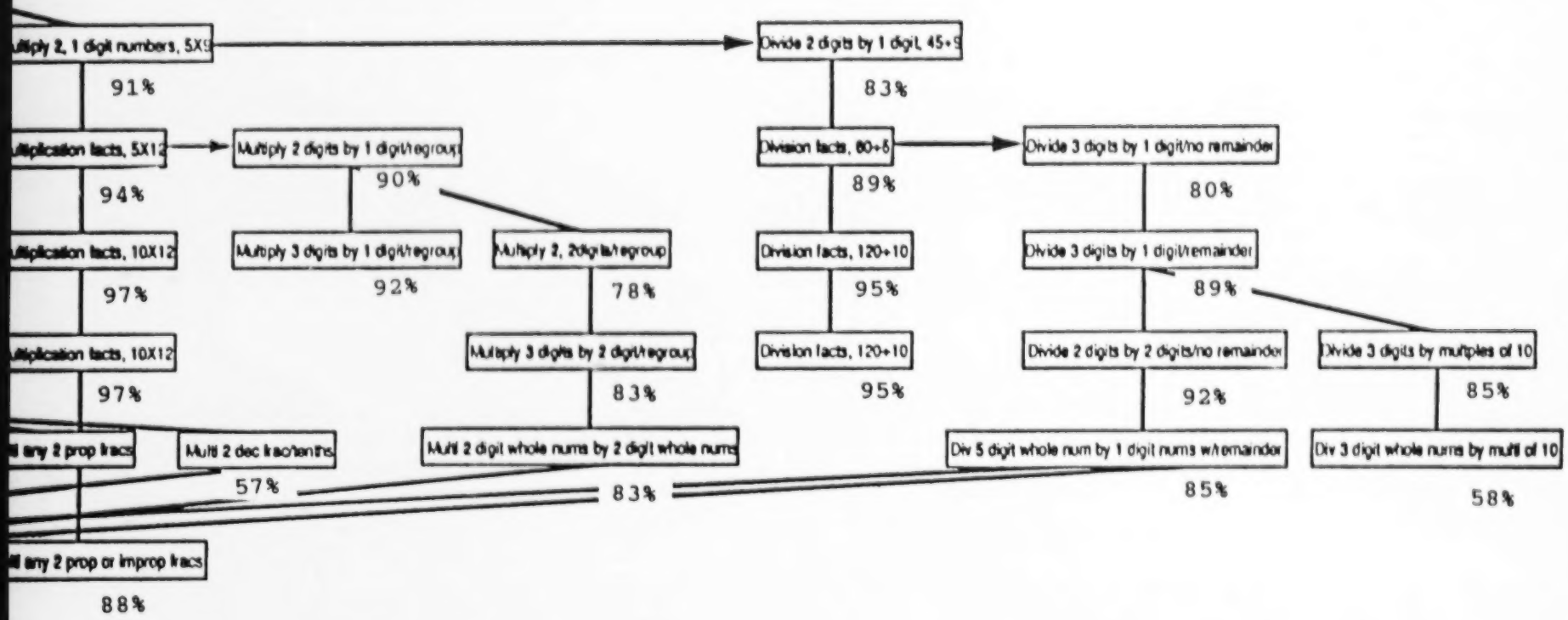
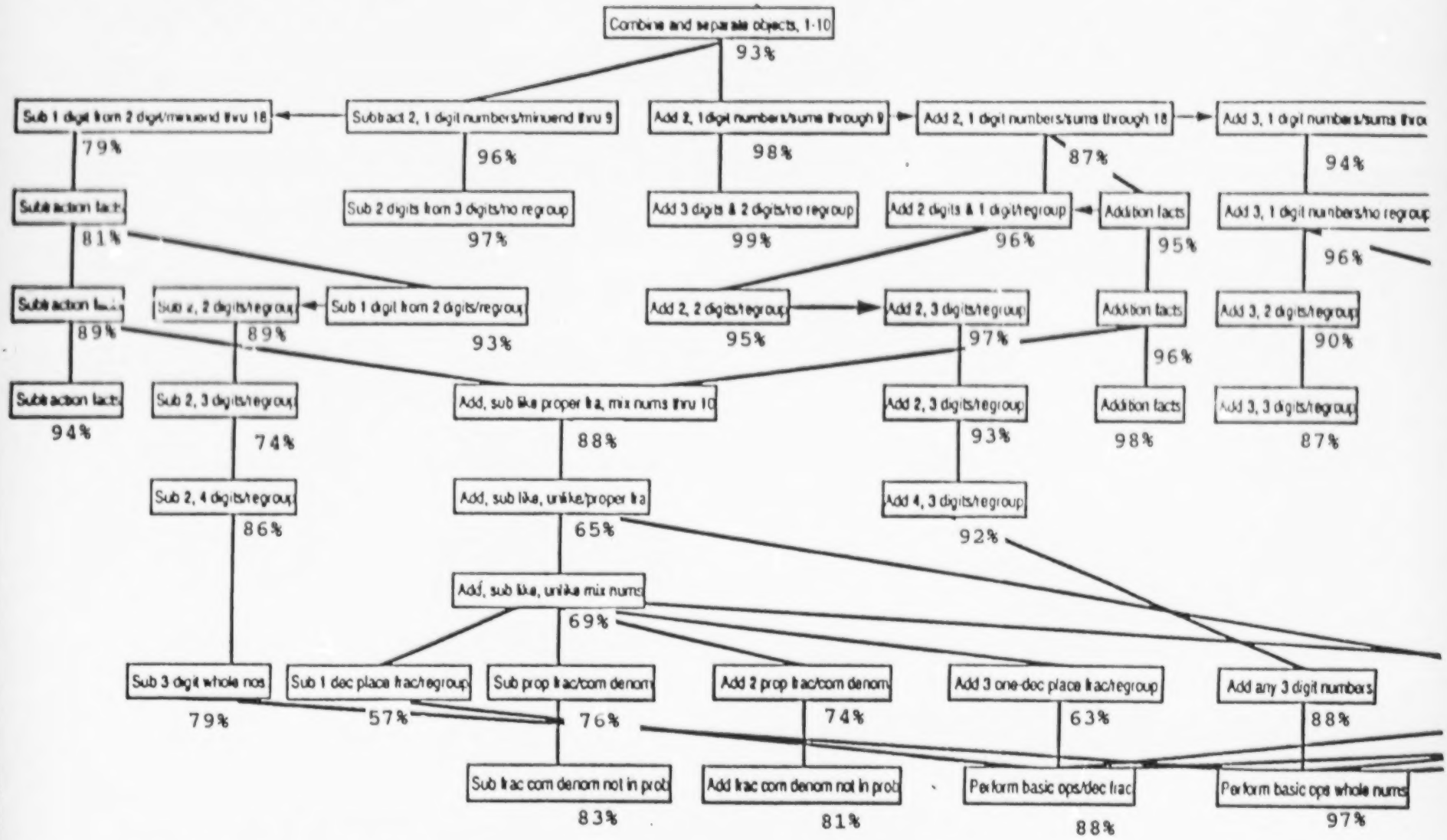
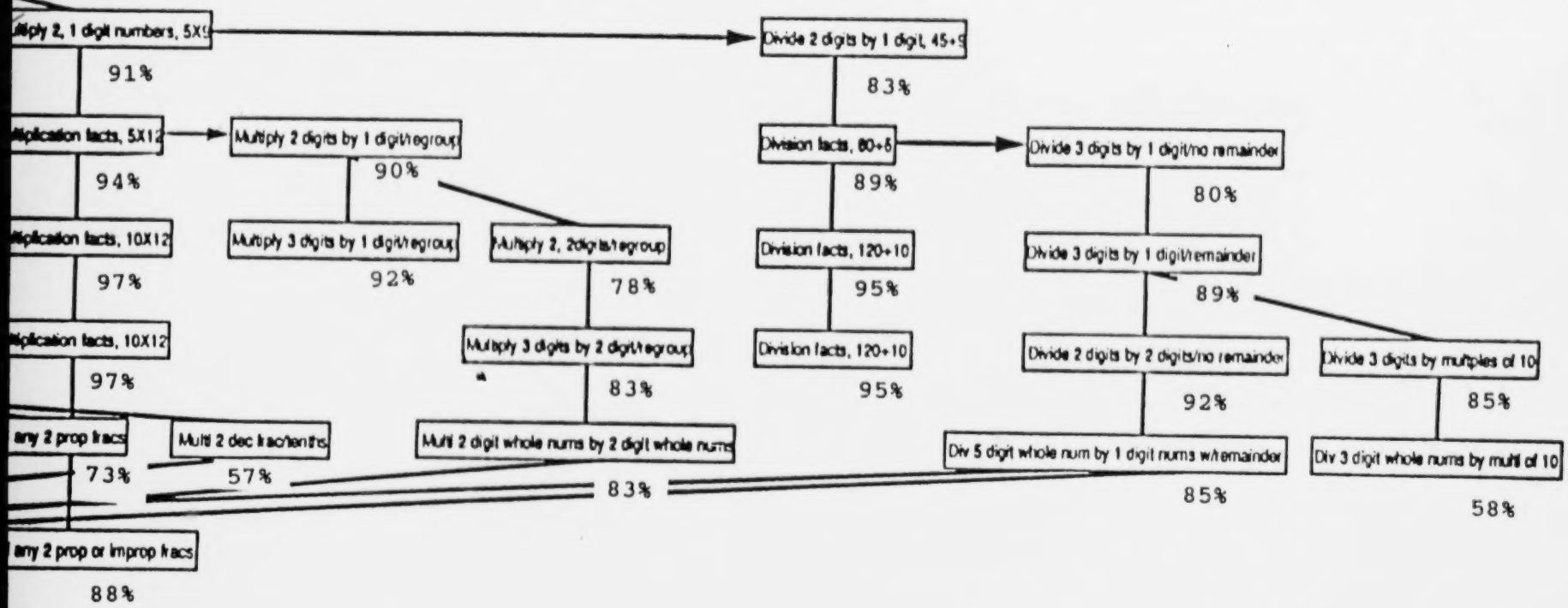

Multiply 2, 1 digit numbers, 5X9
91%
Multiplication facts, 5X12
94%
Multiplication facts, 10X12
97%
Multiplication facts, 10X12
97%
Add any 2 prop fracs
Multi 2 dec fracs/tenths
57%
Add any 2 prop or improp fracs
88%
Multiply 2 digits by 1 digit/regroup
90%
Multiply 3 digits by 1 digit/regroup
92%
Multiply 2, 2digits/regroup
78%
Multiply 3 digits by 2 digit/regroup
83%
Multi 2 digit whole nums by 2 digit whole nums
83%
Divide 2 digits by 1 digit, 45÷9
83%
Division facts, 80÷8
89%
Division facts, 120÷10
95%
Division facts, 120÷10
95%
Divide 3 digits by 1 digit/no remainder
80%
Divide 3 digits by 1 digit/remainder
89%
Divide 2 digits by 2 digits/no remainder
92%
Div 5 digit whole num by 1 digit nums w/remainder
85%
Divide 3 digits by multiples of 10
85%
Div 3 digit whole nums by multi of 10
58%

CHART 2

OPERATION STRAND

1989




ltiply 2, 1 digit numbers, 5X5
91%
ltiplication facts, 5X12
94%
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97%
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97%
any 2 prop fracs
73%
any 2 prop or improp fracs
88%
Multi 2 dec fractenths
57%
Multiply 2 digits by 1 digit/regroup
90%
Multiply 3 digits by 1 digit/regroup
92%
Multiply 2, 2digits/regroup
78%
Multiply 3 digits by 2 digit/regroup
83%
Multi 2 digit whole nums by 2 digit whole nums
83%
Divide 2 digits by 1 digit, 45÷9
83%
Division facts, 80÷8
89%
Division facts, 120÷10
95%
Division facts, 120÷10
95%
Divide 3 digits by 1 digit/no remainder
80%
Divide 3 digits by 1 digit/remainder
89%
Divide 2 digits by 2 digits/no remainder
92%
Div 5 digit whole num by 1 digit nums w/remainder
85%
Divide 3 digits by multiples of 10
85%
Div 3 digit whole nums by multi of 10
58%